BIG-IP® Platform Guide for the Dell® PowerEdge 1655MC Blade Server System

version 4.5

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Product Version

This manual applies to version 4.5 of the BIG-IP® software.

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Getting started

The ***BIG-IP Platform Guide for the Dell PowerEdge 1655MC Blade Server System*** is designed to help you install and activate the BIG-IP® software on your Dell® PowerEdge 1655MC blade server system.

Before you begin installing the BIG-IP software, we recommend that you refer to the following sections of the BIG-IP software documentation.

- Browse the first chapter of the ***BIG-IP Reference Guide;*** read the general information about the BIG-IP products family, and familiarize yourself with the basics of the configuration tool.
- Look through the ***BIG-IP Solutions Guide*** to find the load balancing solution that most closely matches your load balancing needs.
- Briefly review the basic configuration tasks, and note the few pieces of network information that you should gather, such as IP addresses and host names.

All of the BIG-IP system documentation is available for download from the BIG-IP system CD. To access the documentation on the CD, place the disk in a computer with a Windows® operating system that supports **autorun**. The operating system opens a browser page that lists all of the documents and resources available on the CD. You can also download the manuals by navigating to the **/doc** directory on the CD.

Once you have looked through the BIG-IP system documentation and have some basic familiarity with the BIG-IP software, you can begin to install the BIG-IP software on your Dell PowerEdge 1655MC blade server system. The following section gives you a brief overview of the tasks you have to complete.

Task overview

To get the BIG-IP software up and running on the Dell PowerEdge 1655MC blade server system, you complete the following basic tasks:

- Optimize your blade server system hardware for the BIG-IP software.
  (See *Installing the hardware*, on page 1-2.)
- Install the BIG-IP software on the blade server system.
  (See *Installing the BIG-IP software*, on page 1-6.)
- Activate the BIG-IP software license.
  (See *Activating the license*, on page 1-9.)
- Run the Setup utility.
  (See *Using the Setup utility*, on page 1-12.)
- Set up the BIG-IP software configuration.
  (See *Setting up a basic BIG-IP software configuration*, on page 1-13.)
- Back up your configuration data and license information.
  (See *Performing backup and recovery*, on page 1-15.)

What is BIG-IP software?

The BIG-IP software delivers an easy-to-use solution for deploying and managing local area traffic. The software provides a scalable and secure platform where you can build and deploy web-based applications for intranet, extranet, or Internet environments. The BIG-IP software network solutions include:

- Cost-effective, intelligent load balancing for managing user traffic to network servers, and scaling multiple firewalls while providing web site reliability
- Increased cache server performance and scalability through intelligent cache load balancing, object management, and security for cache server farms
- Increased network efficiency through competent management of Secure Sockets Layer (SSL) encryption and decryption for secure online transactions, centralized certificate management, and reduced burden of SSL traffic from web servers

To see an example of the most common network application of the BIG-IP system, see *Setting up a basic BIG-IP software configuration*, on page 1-13.

Installing the hardware

For detailed hardware installation and configuration information, refer to the Dell PowerEdge 1655MC documentation.

Before you install the hardware, you should review, in the following sections, the general information on how to optimize your blade server system hardware for the BIG-IP software.

Console redirection

The default interface for a BIG-IP server blade is through the chassis management card KVM interface. When a server blade is started with BIG-IP software, the software does not support access to the serial port through the chassis management card remote console feature. If you want to configure console redirection, you can configure the BIG-IP software to force console I/O to the serial port. In this configuration, the console I/O can be accessed through the management card Embedded Remote Access (ERA) utility.

◆ Note

If you redirected the console to the serial port, console I/O is not available on the KVM interface.

To force the console I/O to the serial port

1. Open the **/etc/boot.default** file.
2. Locate the entry **console auto** and change this entry to **console com**.
3. Save the **/etc/boot.default** file.
4. Reboot the system and the console I/O is directed to the serial port.

For more information on how to connect to a server blade serial port using the management card ERA interface, see the ***Dell Embedded Remote Access User's Guide***.

Hardware changes or failures

Once you install and activate the BIG-IP software on the blade server system, making any hardware changes on the server blades may require the assistance of F5 technical support.

If you experience any hardware problems that require moving the BIG-IP software to another blade server system, you must contact F5 technical support.

VLAN fail-safe

The Spanning Tree Protocol (STP) on the network switch modules may interfere with VLAN fail-safe. If you plan to use VLAN fail-safe, you need to disable STP on the network switch modules. To disable STP, see the Dell PowerEdge 1655MC documentation. For more information on VLAN fail-safe, see the ***BIG-IP Reference Guide***, Part II, *The Base Network*.

Component configuration

In the most basic component configuration using the BIG-IP software, an external device, such as a router, is directly connected to the external side of the network switch module on the Dell PowerEdge 1655MC. The network switch module channels traffic to the BIG-IP server blade, which load balances inbound Internet traffic to several web server blades connected to the internal side of the switch.

The PowerEdge 1655MC server blades work as delivered, without any configuration. You need to connect only one of the uplink ports on each switch module to the external switch or router; you may use the other uplink ports for additional bandwidth. If you want to use additional uplink ports for increased bandwidth, you must configure the switch ports to use port trunking to link them together. Refer to the ***Dell PowerEdge 1655MC Integrated Switch User's Guide*** for information on configuring the switch ports.

For an introduction to more complex solutions, including load balancing outbound traffic across firewalls and routers, refer to the ***BIG-IP Solutions Guide***, Chapter 1, *BIG-IP System Overview*.

Power management

You can shut down the BIG-IP software server blade by pressing the power button on the front of the server blade.

You can also use the following commands from the console to halt, shut down, or restart a BIG-IP software server blade.

`halt`

This command gracefully brings the server blade down, without turning off the power. Using this command allows you to either restart the server blade by pressing the Enter key, or to manually turn the power off, by either pressing the power button on the server blade front panel, or removing the chassis power.

`poweroff`

This command initiates a graceful shutdown, and turns off power to the server blade. If you use this command, you must use the front panel power button or the Dell Embedded Remote Access utility to turn the server blade back on.

`reboot`

This command gracefully restarts the server blade.

Using the remote access utility

You can also control the BIG-IP system server blade from the Dell Embedded Remote Access (ERA) utility that resides on the chassis System Management Card. Refer to the ***Dell PowerEdge 1655MC User's Guide*** for details on how to connect to the management card through either a network or serial interface. The server blade responds to the ERA utility commands **serviceaction powerdown** and **powerup**. Refer to the ***Dell Embedded Remote Access User's Guide*** for more information.

Installing the BIG-IP software

Once you have properly installed the blade server system hardware, you are ready to install the BIG-IP software. To install the BIG-IP software on the Dell PowerEdge 1655MC, you use the network boot procedure known as a Pre-boot Execution Environment (PXE). The BIG-IP software installation disk supports configuring a host to act as a PXE server. Complete the following tasks to install the BIG-IP software:

- Select a host to act as a PXE server.
- Configure the host as a PXE server.
- Connect to the blade server system.
- Perform a PXE boot.

◆ Note

The BIG-IP software does not currently support booting from a CD-ROM drive connected directly to the Dell PowerEdge 1655MC.

Selecting a host to act as a PXE server

To begin the installation process, select a host machine that can act as a PXE server. The machine you select must:

- Have a CD-ROM drive
- Support booting from the CD-ROM drive
- Reside on the same network as the target blade server system

Connect the host to any of the RJ-45 10/100/1000 ports located on the applicable blade server system network switch module.

Configuring the host as a PXE server

After you have connected the host to the blade server system, insert the CD into the host, and reboot the system from the CD-ROM drive, as appropriate. You can now reconfigure the host as a PXE server.

To configure the host as a PXE server

1. To select an installation option, at the initial prompt select **2**, **Set up server to provide network installation**.
2. From the list of available network interfaces on the machine, select an interface as the PXE server interface.
3. When prompted, select a DHCP server, based on whether you are using an existing DHCP server, or setting up the host as the DHCP server.

To use an existing DHCP server on the subnet

a) Select **yes** at the prompt. This avoids possible conflicts and automatically completes the PXE server configuration.
The host displays the settings you selected, and prompts you to accept or reject them.

b) If the settings are correct, type **yes** to accept them. If the settings are not correct, type **no**, and the host repeats the prompts. The PXE server configuration is not complete until you accept the settings.

To set up the host as the DHCP server

a) Select **no** at the prompt. This produces the following series of prompts:

```
IP network [10.1.10]?
IP address of server 10.1.10[n] [199]?
Lower range for clients 10.1.10.[n] [199]?
Upper range for clients 10.1.10.[n] [200]?
```

b) If your subnet is private, accept the default IP addresses provided. If other machines share the subnet, and possible conflict exists, substitute appropriate unique addresses and ranges.
The host displays the settings you selected, and prompts you to accept or reject them.

c) If the settings are correct, type **yes** to accept them. If the settings are not correct, type **no** and the host repeats the prompts. The PXE server configuration is not complete until you accept the settings.

Connecting to the blade server system

Once you have configured the PXE server, you must connect a keyboard and monitor to the Dell 1655MC Chassis System Management Module, in order to install the BIG-IP software.

To connect a keyboard and monitor to the chassis system management module integrated KVM

1. Connect the data cable of the monitor to the VGA connector on the rear of the blade server system, and connect the power cable to a grounded outlet.
2. Connect the keyboard to the PS2 keyboard connector on the rear of the blade server system.
   You can optionally connect the mouse to the PS2 mouse connector on the rear of the blade server system.
3. If the target server blade is not on, press the power button.
4. To bring up the integrated KVM window, press the Print Screen key.
5. Select the server blade to which you wish to be connected, and press Enter.
   The KVM switch switches the video and keyboard signals so you can monitor and control the server blade.

Performing a PXE boot

Once you have a keyboard and monitor connected to the blade server system, begin the PXE boot process.

To boot the blade server system from a PXE server

1. Connect a port on the applicable LAN switch to the subnet on which the PXE server is active.
2. Reboot the server blade.
3. At the initial boot up screen, press F12 to force a PXE boot.
4. Following a stream of boot sequence status messages, a **boot from** dialogue box displays.
5. Press the arrow up/down keys to select the interface through which you wish to perform the network installation, and press Enter.
   Onboard1Broadcom MBA is connected to the chassis network switch module 1 (upper), and Onboard2Broadcom MBA is connected to the network switch module 2 (lower).
6. After a series of status messages, you are prompted to select whether you want to continue. Type **yes,** or press Enter, to continue and complete the installation.

Activating the license

Once you have loaded the BIG-IP software onto the target server blade(s), you must have a valid license certificate to activate the software. To gain a license certificate, you need to provide two items to the license server: a registration key and a dossier.

The ***registration key*** is a 25-character string that lets the license server know which F5 Networks' products you are entitled to license. If you downloaded the BIG-IP software, you should have received the registration key by email. Otherwise, you can find it on the back of the CD case.

You obtain the dossier from the BIG-IP kernel; the ***dossier*** is an encrypted list of key platform characteristics that the BIG-IP software uses to identify the platform, and to enforce or restrict activation on the platform.

You can obtain a license certificate using one of the following methods:

- **Automatic license activation**
  This method is for systems that have direct Internet access. You perform automatic license activation from the BIG-IP command line or from the BIG-IP Configuration utility, which is the BIG-IP software user interface. The automatic license activation method automatically retrieves and submits the dossier to the F5 Networks license server and installs the signed license certificate. For this method to succeed, the target blade server system must be installed on a network with direct Internet access.
- **Manual license activation**
  This method is for systems that run behind a firewall or in other network environments that do not have direct Internet access. This process requires that you have an administrative workstation that can access both the BIG-IP system and the Internet. You perform manual license activation using the BIG-IP Configuration utility. With the manual license activation method, you manually submit the dossier to, and retrieve the signed license file from, the F5 Networks license server. For this method to succeed, the administrative workstation must have direct Internet access.

◆ Note

You can run the Configuration utility using Netscape® Navigator, version 4.7, or Microsoft® Internet Explorer, versions 5.0 or 5.5.

To automatically activate a license from the command line

1. At the logon prompt on the command line, type the user name **root** and the password **default**.
2. At the prompt, type **license**.

   The following prompts display:

   ```
   IP:
   Netmask:
   Default Route:
   1.1, 1.2

   Select interface to use to retrieve license
   ```

3. Type the appropriate value for each prompt (the blade server system uses this information to make an Internet connection), and continue to the following prompt:

   ```
   The Registration Key should have been included with the
   BIG-IP software or given when the order was placed.

   Do you have your Registration Key? [Y/N]:
   ```

4. Type **Y**, and the following prompt appears:

   ```
   Registration Key:
   ```

5. Type the 25-character registration key you have received.
   The dossier is retrieved and sent to the F5 Networks license server, and a signed license file is returned and installed. A message appears indicating the process was successful.
6. To finish the licensing process, if you have not previously accepted an End User License Agreement (EULA), proceed to the EULA acceptance screen, review the EULA, and accept it.

To automatically activate a license using the Configuration utility

1. Open a browser from the administrative workstation, and open the Configuration utility using the following address:
   https://192.168.1.245.
   This is a default address on the server blade's local area network.
2. Type the user name **root** and the password **default** at the log on prompt.
   The Configuration utility menu displays.
3. Click **License Utility** to open the License Administration screen.
4. In the **Registration Key** box, type the 25-character registration key that you received, and click **Automated Authorization**.
   The License Status screen displays status messages, and **Process complete** appears when the licensing activation is complete.
5. Click **License Terms**, review the EULA, and accept it.
6. At the Reboot Prompt screen, select when you want to reboot the server blade.
   You must reboot the server blade to complete the license activation.

To manually activate a license using the Configuration utility

1. Open a browser from the administrative workstation, and open the Configuration utility using the following address: **https://192.168.1.245**.
   This is a default address on the server blade's local area network.
2. At the logon prompt, type the user name **root** and the password **default**.
   The Configuration utility menu appears.
3. Click **License Utility** to open the License Administration screen.
4. In the **Registration Key** box, type the 25-character registration key that you received, and click **Manual Authorization**.
5. At the Manual Authorization screen, retrieve the dossier using one of the following methods:
   - Copy the entire contents of the **Product Dossier** box.
   - Click **Download Product Dossier**, and save the dossier to the hard drive.
6. Click the following link in the **License Server** box: (**http://activate.f5.com/f5/index.jsp**)
   The Activate F5 License screen opens in a new browser window.
7. On the Activate F5 License screen, submit the dossier using the following method that is appropriate to your choice in step 5:
   - In the **Enter your dossier** box, paste the data you just copied, and click **Activate**.
   - At the **Product Dossier** box, click **Browse** to locate the dossier on the hard drive, and click **Activate**.

   The screen returns a signed license file.
8. Retrieve the license file using one of the following methods:
   - Copy the entire contents of the signed license file.
   - Click **Download license**, and save the license file to the hard drive.
9. Return to the Manual Authorization screen, and click **Continue**.
10. At the Install License screen, submit the license file using the following method that is appropriate to your choice in step 8:
    - Into the **License Server Output** box, paste the data you have copied, and click **Install License**.
    - At the **License File** box, click **Browse** to locate the license file on the hard drive, and click **Install License**.

    The License Status screen displays the status messages, and the message **Process complete** appears when the BIG-IP software has finished activating the license.

11. To finish the licensing process, click **License Terms**, review the EULA, and accept it.
12. At the Reboot Prompt screen, select when you want to reboot the server blade.
    You must reboot the server blade to complete the license activation.

Using the Setup utility

Once you activate the license, the next step in the process is to run the Setup utility. The Setup utility defines the initial configuration settings required to install the BIG-IP system into the network.

See the ***BIG-IP Reference Guide,*** Part II, *The Base Network* for full details and instructions on running the Setup utility. You can download the guide from the CD.

WARNING

If you are using the BIG-IP software in a redundant system, you must configure network-based fail-over, and not hardwired fail-over. We recommend that you configure network-based fail-over during the Setup utility, as opposed to configuring it in the Configuration utility. For additional information on configuring fail-over, see the ***BIG-IP Reference Guide****, Part IV,* ***Redundant BIG-IP Systems****.*

Setting up a basic BIG-IP software configuration

The most common application of the BIG-IP software is to distribute traffic across an array of web servers that host standard web traffic, including e-commerce traffic. Figure 1.1, on page 1-14 shows a configuration where a BIG-IP system load balances two sites: **www.siterequest.com** and **store.siterequest.com**. The **www.siterequest.com** site provides standard Web content, and the **store.siterequest.com** site is the e-commerce site that sells items to **www.siterequest.com** customers.

To set up load balancing for these sites, you need to create two pools that are referenced by two virtual servers, one for each site. Even though the sites are related and may even share the same IP address, each requires its own virtual server. This requirement exists because each site uses a different port to support its particular protocol: port **80** for the HTTP traffic going to **www.siterequest.com**, and port **443** for the SSL traffic going to **store.siterequest.com**. Note that this is true even when there are both a port **80** and a port **443** on the same physical server, as is the case with **Server 2**.

For specific information on how to create pools and virtual servers, see the ***BIG-IP Reference Guide***, Part III, *The High-Level Network.*

Important

In this example, we use only non-routable IP addresses. In a real topology, you have to include virtual server IP addresses that are routable to the Internet.

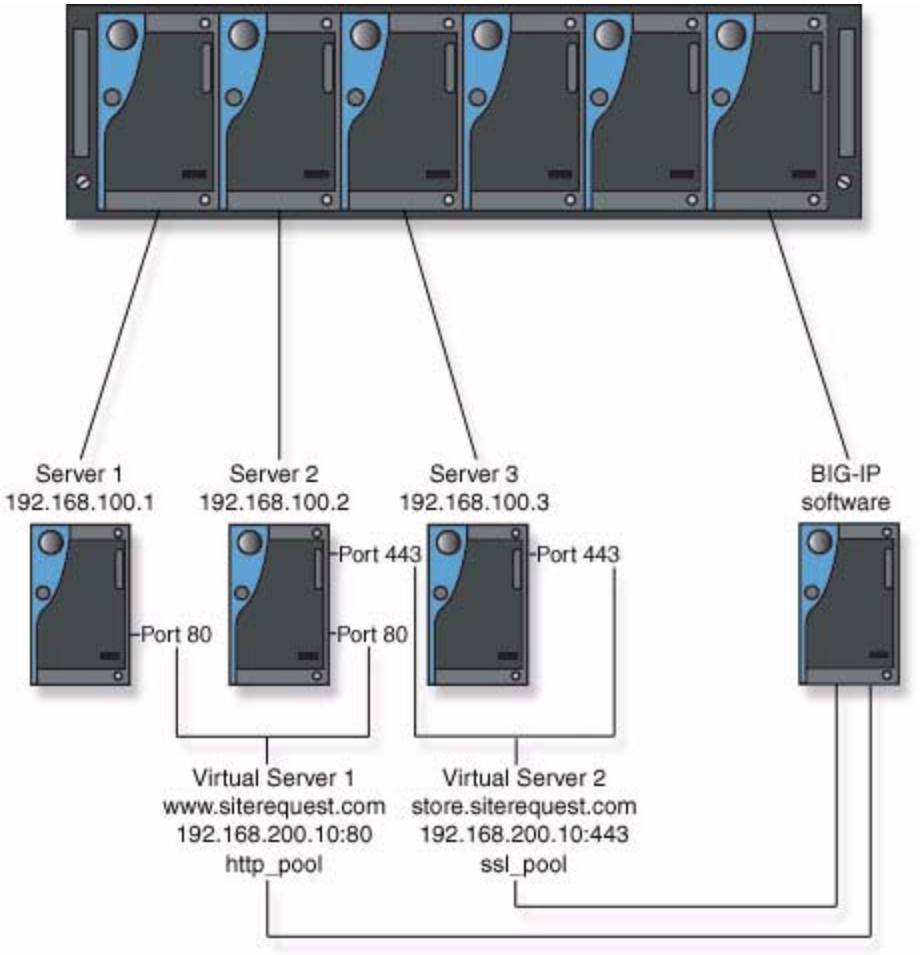

Figure 1.1 *Basic network configuration*

Performing backup and recovery

Each time you perform a clean installation of the BIG-IP software, you completely delete all configuration data. Therefore, we recommend that each time you perform a new installation or upgrade of the BIG-IP software, you also back up the configuration data and license information, and store it in a remote location. Completing this backup ensures that you have retained your configuration data and license information in case you need to recover the BIG-IP software in the future.

You perform backups by running the **bigpipe config save** command on the client system. This command creates a User Configuration Set (**.ucs**) file that you can copy to a remote location. If you need to perform a recovery, you can copy this file from its remote location back to your local system prior to running the **bigpipe config install** command. You can also perform a backup or recovery from the Configuration utility.

To back up or recover a configuration using the Configuration utility

1. Open a browser from the administrative workstation.
2. Open the Configuration utility, using the address you configured for the BIG-IP system when you ran the Setup utility.
3. In the navigation pane, click **System Admin**.
   The User Administration screen opens.
4. Click the Configuration Management tab.
   The Configuration Management screen opens.
5. Complete the following steps, depending on whether you are going to back up or restore a configuration.

   To back up a configuration:

   a) From the **Save Configuration** section, in the **Enter Path** box, type the path where you want your configuration file(s) saved, or select a path from the list. If you do not specify a path, the BIG-IP system saves files to the **/usr/local/ucs** directory. The BIG-IP system appends the extension **.ucs** to file names without the extension.

   b) Click the **Save** button.

   To restore a configuration:

   a) From the **Restore a Configuration** section, in the **Enter Path** box, type a path, or select one from the list.

   b) To restore the configuration to the BIG-IP system, click the **Restore** button.

   c) To check the status of the restoration, click the **View Log** button.

For more information on how to perform a backup or recovery from the Configuration utility, see the online help for the System Admin/Configuration Management screen.

For detailed information on backup and recovery procedures, see the Technical Note **BIG-IP Backup and Recovery;** you can find this on the F5 Networks technical support web site (**http://tech.f5.com)**.

If you have a working system and are performing a clean installation, you can update your configuration data simply by running the **bigpipe config save /config.ucs** command. This command automatically rolls your current configuration data to the new version of the BIG-IP software that you are installing. Although this method of retaining your configuration data is reliable, we recommend that you also store a copy of your configuration data in a remote location.

Finding additional resources

You can use the following resources to find additional technical information about BIG-IP software:

- **Reference and solutions guides**
  You can download additional documentation such as the ***BIG-IP Reference Guide*** and the ***BIG-IP Solutions Guide*** from the Documentation section of the CD.
- **Release notes**
  You can obtain a copy of the release notes for the current version of this product from the product web server home page, or from the technical support web site (**http://tech.f5.com/blade)**. The release notes contain the latest information for the current version, including a list of new features and enhancements, a list of fixes, and, in some cases, a list of known issues.
- **Online help**
  You can find help online in three different locations:
  - The web server on the product includes PDF versions of the BIG-IP software guides.
  - The web-based Configuration utility has online help for each screen. Simply click the **Help** button.
  - Individual **bigpipe** commands have online help, including command syntax and examples, in standard UNIX man page format. To get this help, from the command line, type the command followed by the word **help**, and the BIG-IP software displays the syntax and usage associated with the command.
- **Third-party documentation for software add-ons**
  The web server on the product contains online documentation for all third-party software, such as ZebOS.
- **Technical support through the World Wide Web**
  The F5 Networks Technical Support web site, **http://tech.f5.com**, provides the latest technical notes, answers to frequently asked questions, updates for administrator guides (in both PDF and HTML formats), and the Ask F5 natural language question and answer engine.

Glossary

bigpipe

The **bigpipe** utility provides command line access to the BIG-IP software.

BIOS

BIOS stands for basic input/output system. The BIOS is software that is built-in to the computer, and determines what the computer can do without accessing programs from a disk.

blade server system

A blade server system is an enclosure that houses server blades and provides shared components such as power, fans, and cabling. See also *server blade*.

chassis

See *blade server system*.

Configuration utility

The Configuration utility is the browser-based application that you use to configure the BIG-IP software.

DHCP

DHCP stands for Dynamic Host Configuration Protocol. It is a protocol used to assign dynamic IP addresses to network devices. When using DHCP, a network device can have a different IP address each time it connects to the network.

DNS

DNS stands for Domain Name System. It is a service that translates domain names into IP addresses. For example, the domain name **www.siterequest.com** might translate to **101.102.103.104**.

dossier

A dossier is an encrypted list of key platform characteristics used to identify the platform, and to enforce or restrict activation on the platform. See also *registration key*.

host

A host is a network server that manages one or more virtual servers that the BIG-IP software uses for load balancing.

license certificate

A license certificate is a digital file created by the F5 Networks license server. The license server uses your product registration key and dossier to process the file, which is stored on the BIG-IP system. See also *registration key* and *dossier*.

network boot

A network boot is a method of starting up a computer, where you load the operating system and other basic software from a network rather than from a source within the computer itself (such as a CD-ROM drive or the hard drive).

NIC

NIC stands for network interface card. It is an expansion board used to connect a computer to a network.

port

A port is represented by a number that is associated with a specific service supported by a host.

PXE

PXE stands for Pre-Boot Execution Environment, and it is a network boot method. It allows you to boot a computer from a server on a network before you boot the operating system on the local hard drive. See also *network boot*.

registration key

The registration key is a 25-character string that you need to license your F5 Networks products. You may have received the registration key from F5 Networks by email, or you may find it on the back of the CD case. See also *dossier*.

server blade

A server blade is a board that contains memory, a processor, disk storage, network connectivity, and other associated electronics. It is housed with other server blades in a blade server system, which is an enclosure that provides shared components such as power, fans, and cabling. See also *blade server system*.

Setup utility

The Setup utility guides you through the initial system configuration process. The Setup utility runs automatically when you turn on a system for the first time.

SSH

SSH stands for Secure Shell. It is a protocol used for secure remote login and other secure network services over a non-secure network.

SSL

SSL stands for Secure Sockets Layer. It is a protocol that uses a public key to encrypt data that is transmitted through the Internet over an SSL connection.

subnet

A subnet is a portion of a network that shares a common address component. For instance, on TCP/IP networks, subnets are all devices whose IP addresses have the same prefix segment.

virtual server

A virtual server is a specific combination of a virtual IP address and a virtual port, associated with a content site that is managed by BIG-IP software or other type of host server.

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